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THE COMMERCIAL SPACE LAUNCH ACT: THE REGULATION OF PRIVATE SPACE TRANSPORTATION

MICHAEL S. STRAUBEL*

INTRODUCTION

SPACE IS NO longer the sole domain of governments. Private enterprise has discovered that a dollar can be made in outer space. Although private enterprise within the United States has moved into space activities such as telecommunications and materials processing, only the government has provided transportation into space.¹ This is changing, however, because the United States government is in the process of withdrawing from the commercial space transportation market. As private enterprise steps into the void left by the government's withdrawal, the legal and regulatory regime which will govern private space transportation services will become very important. This article will explore and evaluate the legal regime created by the Commercial Space Launch Act (Act)² and faced by potential United States transportation providers.

Before examining the existing legal regime, this article will examine the business potential for space transporta-

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¹ The French company Arianespace is the only nongovernment organization presently capable of providing launch services.

² Commercial Space Launch Act, 49 U.S.C. §§ 2601-2623 (Supp. 1984).

tion and the need for regulation. The United States has been, and to a large extent still is, dominating commercial launch services and space activity. Recently, though, China,³ Japan,⁴ the Soviet Union,⁵ and France, through the French company, Arianespace,⁶ have demonstrated marketable launch capabilities. This internationalization of launch capabilities has added many variables to the business climate for launch services. With government-backed competitors in the field, factors such as national prestige, military considerations, and the acquisition of foreign capital have become important. These factors can lead a government to subsidize its launch charges.⁷ Therefore, the international nature of the launch service business will make the going rough for new private launch companies without government backing.

Within the United States, the National Aeronautics and Space Administration (NASA) has had a lock on the market because competitors have been unable to match the prices charged by NASA.⁸ NASA's stranglehold on the

³ Witt, *Earth-bound U.S. Firm Sees China as Only Hope*, Chi. Tribune, May 13, 1986, at 3, col. 5. China has recently begun negotiating with potential launch customers. Teresat, Inc. and China have signed a memorandum of agreement for the launch of two satellites on the Chinese Long March-3 rocket. The launches are to take place some time in late 1987. *Id.*

⁴ *H-1 Proves Japanese Launch Capability*, AV. WEEK & SPACE TECH., Aug. 25, 1986, at 25.

⁵ Marsh, *Russia May Use Jardine in Satellite-Launch Deals*, Financial Times, (London) Oct. 20, 1986, at 1, col. 3. The Soviet Union has approached a Hong Kong based trading company about marketing the Soviet's Proton rocket for commercial launches. Though the Soviet Union can likely offer United States telecommunication companies launch services cheaper than its Western competition, United States technology transfer regulations may prevent shipment of sophisticated American made satellites to the Soviet Union. *Id.*

⁶ See Ford Urges Federal Intervention in Launch Insurance Market, AV. WEEK & SPACE TECH., Aug. 25, 1986, at 25. Arianespace has provided launch services since 1979. *See id.*

⁷ On May 25, 1984, Transpace Carriers, Inc. filed a petition with the Office of the United States Representative alleging that the European Space Agency and Arianespace had engaged in predatory pricing in the marketing of launch services. The petition was eventually denied by President Reagan. U.S. DEP'T OF TRANSP., REPORT OF THE OFFICE OF COMMERCIAL SPACE TRANSPORTATION ON FEDERAL IMPEDIMENTS TO DEVELOPMENT OF A PRIVATE COMMERCIAL LAUNCH INDUSTRY 10-12 (July, 1985)[hereinafter THE DOT REPORT].

⁸ See The Center of Space Policy, Inc., Cambridge, Mass., COMMERCIAL SPACE

market, however, is about to end. The Reagan Administration, as a result of its critique of the United States' space program following the shuttle Challenger accident, decided to limit NASA's commercial launch activity. On August 15, 1986, President Reagan announced that

NASA will no longer be in the business of launching private satellites . . . NASA and our shuttles can't be committing their scarce resources to things which can be done better and cheaper by the private sector. Instead, NASA and the four shuttles should be dedicated to payloads important to national security and foreign policy, and even more, on exploration, pioneering and developing new technologies and uses of space.⁹

While the redirection of the shuttle program holds great promise for the commercial expendable launch vehicle (ELV)¹⁰ industry, many uncertainties in the Administration's policy are causing great concern. First, the shuttle program is not completely out of the launching business. NASA is not required to cancel any of the forty-four launch contracts entered into before the Challenger accident. The shuttle is scheduled to perform fifteen of the launch contracts through 1992.¹¹ Second, the shuttle will continue to launch payloads with foreign policy implications¹² and shuttle-unique payloads.¹³ These loopholes in the plan for the shuttle's future commercial use make

INDUSTRY IN THE YEAR 2000: A MARKET FORECAST 136 (June 1985) [hereinafter A Market Forecast]. For an explanation of NASA's pricing policies, see THE DOT REPORT, *supra* note 7, at 9-10.

⁹ Foley, *Reagan Bars Shuttle From Competing For New Satellite Launch Contracts*, AV. WEEK & SPACE TECH., Aug. 25, 1986, at 22.

¹⁰ An expendable launch vehicle is a non-reusable unmanned rocket used to put a payload (usually a communication satellite) into earth orbit.

¹¹ Foley, *supra* note 9, at 22.

¹² *Id.* Such payloads, which are already under contract, might include two Inmarsat satellites, two Indian Insats, Indonesia's Palapa B3, and two British Skynet 4 military communication satellites. See *Shuttle Payloads*, AV. WEEK & SPACE TECH., Aug. 25, 1986, at 23.

¹³ Foley, *supra* note 9, at 22. A West German Spacelab might be a shuttle-unique payload. NASA and the Economic Policy Council, a cabinet-level organization, are drafting a priority list for the launch of the forty-four launch contracts. *Id.* at 23.

market assessment difficult for potential ELV manufacturers and marketers.

Among the other problems facing the development of a private launch industry,¹⁴ the absence of a guaranteed market is the greatest impediment to the future development of the industry within the United States. The costs of developing a launch vehicle and establishing an assembly line are so great that finding a guaranteed buyer for a significant number of vehicles is necessary to recover the invested capital. Since the shuttle became NASA and the military's primary means of space transportation, except for Martin Marietta's Titan program, ELV production lines have remained dormant.¹⁵ Presently, only the Air Force's search for a medium launch vehicle (MLV) promises a guaranteed market for an ELV manufacturer.¹⁶ The winner of the Air Force's contract for MLV production will probably emerge as the dominant (if not sole) private launcher of commercial payloads.

Despite all of the uncertainties, the aerospace industry is gearing up to enter the private space transportation market. Martin Marietta, manufacturers of the Titan launch vehicle, has spoken with organizations needing to launch twenty-five communication satellites.¹⁷ If some predictions are correct, commercial space transportation activity will become extensive.¹⁸ With this possibility, the

¹⁴ The other problems facing the development of a private ELV industry include a potential slump in launch demand (fewer satellites to be launched) and difficulties obtaining launch insurance. See, Lowndes, *Shuttle Decision Fails to Allay Satellite Business Confusion*, AV. WEEK & SPACE TECH., Aug. 25, 1986, at 25 (discussing a potential slump in launch demand); Ford Urges Federal Intervention in Launch Insurance Market, *supra* note 6, at 24.

¹⁵ See Foley, *supra* note 9, at 22.

¹⁶ *Air Force Selects MLV Contractors*, AV. WEEK & SPACE TECH., Aug. 18, 1986, at 22.

¹⁷ Covault, *Martin Seeks Commercial Titan Launch Customers*, AV. WEEK & SPACE TECH., Aug. 25, 1976, at 24.

¹⁸ The Center for Space Policy predicts a high of \$2.4 billion in revenues by the year 2000. A Market Forecast, *supra* note 8, at 150. The phrase "space transportation" is used because it is quite possible that a shuttle or two will be privately operated by the year 2000.

matter of regulating the transportation industry becomes increasingly important.

The United States government has recently taken an interest in regulating and managing nongovernmental space transportation to ensure public safety, compliance with international obligations, and national security, and to pursue foreign policy objectives.¹⁹ While the government's interest has been less than organized, the enactment of the Commercial Space Launch Act in 1984 marked the beginning of a sound policy toward space transportation regulation and management.

I. REGULATION PRIOR TO THE COMMERCIAL SPACE LAUNCH ACT

Before the enactment of the Commercial Space Launch Act, three launch permission requests had been filed with the government. Two of the planned missions resulted in launches, and the third exploded during an engine test firing. Space Services Incorporated of America, a Houston-based company headed by former Mercury astronaut Donald (Deke) Slayton, has twice sought launch permission. In 1981 Space Services sought permission to launch the liquid-fueled Percheron rocket.²⁰ As part of the launch permission process, Space Services obtained a waiver of applicable Federal Aviation Administration (FAA) regulations for the launch of unmanned rockets.²¹ In exchange for the waiver of its regulations, the FAA required that the rocket land within United States territorial water.²² Unfortunately, before the launch could take place, a valve failed to open during an engine test, and the

¹⁹ For a review of the international obligations created by the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies and the other four space treaties, see Brumberg, *Regulating Private Space Transportation*, 36 ADMIN. L. REV. 363 (1984).

²⁰ Jacobs, *A Private Enterpriser Joins the Space Race*, INDUSTRY WEEK, Nov. 29, 1982, at 52.

²¹ E. FINCH & A. MOORE, *ASTROBUSINESS: A GUIDE TO THE COMMERCE AND LAW OF OUTER SPACE* 62 (1985) [hereinafter FINCH & MOORE].

²² Dula, *Private Sector Activities in Outer Space*, 19 INT'L LAW. 159, 180-81 (1985).

liquid fuel (kerosene and gunpowder) exploded, destroying the rocket on the launch pad.²³

Space Services' second launch was more successful. On September 9, 1982, Space Services launched the Conestoga I from a makeshift launch pad on Matagorda Island off the Texas Gulf Coast.²⁴ In ten minutes the rocket traveled over 300 miles downrange into international waters.²⁵

Although the FAA and other government agencies cooperated with Space Services, the company had to deal with many unknowns when seeking launch approval. Neither one agency nor one set of rules existed to determine the procedures necessary to obtain launch approval. Specifically, for its Conestoga launch, Space Services had to obtain permission from three different federal agencies.²⁶ The FAA waived the regulations governing suborbital launches²⁷ and issued an order designating the airspace above Matagorda as temporarily restricted.²⁸ The Federal Communications Commission (FCC) issued Space Services an experimental radio license which allowed the use of frequencies on a nonexclusive and temporary basis.²⁹ Furthermore, though of questionable applicability, the Department of State issued an export license under the authority of the Arms Export Control Act.³⁰ The Department of State's primary reason for re-

²³ Jacobs, *supra* note 20, at 54; *Free Enterprise Goes Into Space*, U.S. NEWS & WORLD REP., Sept. 20, 1982, at 12.

²⁴ Marbach & Shapiro, *A Giant Step for Capitalism*, NEWSWEEK, Sept. 20, 1982, at 64; see *Free Enterprise Goes Into Space*, *supra* note 23, at 12.

²⁵ Reinhold, *Texas Rocket Built on "Shoestring" Carries Free Enterprise Into Space*, N.Y. TIMES, Sept. 10, 1982, at 1, col. 4; see *Free Enterprise Goes Into Space*, *supra* note 23 at 12.

²⁶ *Free Enterprise Goes Into Space*, *supra* note 23, at 12.

²⁷ Myers, *Federal Government Regulation of Commercial Operations Using Expendable Launch Vehicles*, 12 J. SPACE L. 40, 43 (1984). The FAA regards Part 101, sub-part C, of the Federal Aviation Regulations (FARs) as the only FARs governing rocket launches. Part 101, sub-part C, was originally adopted to ensure that small rockets launched by hobbyists and scientists would not endanger air traffic. *Id.* at n.12.

²⁸ Dula, *supra* note 22, at 181.

²⁹ FINCH & MOORE, *supra* note 21, at 66.

³⁰ *Id.* at 64. See Arms Export Control Act, 22 U.S.C. § 2278 (1982).

quiring an export license was to ensure compliance with applicable international treaties concerning government liability for private space activity.³¹ Other agencies were also involved in the process of reviewing Space Services' launch proposal. Though they disclaimed any regulatory authority, NASA played a large role in reviewing the technical safety of the launch.³²

The third private launch occurred when Starstruck Incorporated launched its prototype Dolphin rocket on August 3, 1984, in the Pacific Ocean off San Clemente Island.³³ By the time Starstruck sought launch permission, the Office of Commercial Space Transportation (OCST) had been created within the Office of the Secretary of Transportation. OCST provided Starstruck with the single governmental contact point Space Services did not have. Therefore, Starsbruck went through a far less cumbersome process than that of Space Services.

The Office of Commercial Space Transportation (OCST), which now administers the Commercial Space Launch Act, had its origins in the Presidential Space Policy announced on July 4, 1982.³⁴ That policy, announced by President Reagan during ceremonies following the re-

³¹ Dula, *supra* note 22, at 180. Articles VI and VII of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, United States-United Kingdom-USSR, 18 U.S.T. 2410, T.I.A.S. No. 6347, and the Convention on International Liability For Damage Caused by Space Objects, Mar. 29, 1972, United States-United Kingdom-USSR, 24 U.S.T. 2389, T.I.A.S. No. 7762, create a legal regime of state liability for national activity in outer space. Under this regime the United States government would be responsible for any damage caused by the Conestoga launch.

³² Dula, *supra* note 22, at 180. NASA has consistently denied any authority to regulate commercial launch activity through the National Aeronautics and Space Act, 42 U.S.C. §§ 2451-2477, 2481-2484 (1982). However, the Act may be read to give NASA the authority to regulate private launches.

³³ *Starstruck Launches Prototype Dolphin Rocket in First Flight*, AV. WEEK & SPACE TECH., Aug. 13, 1984, at 20. Starstruck has since experienced financial difficulties and undergone reorganization. *Starstruck Mulls Land Launching*, SPACE BUS. NEWS, Nov. 19, 1984, at 6; *Booster Tests, Workforce Cut by Starstruck*, AV. WEEK & SPACE TECH., Sept. 24, 1984, at 25.

³⁴ Remarks on the Completion of the Fourth Mission of the Space Shuttle Columbia, 18 WEEKLY COMP. PRES. DOC. 869 (July 14, 1982).

turn of the Shuttle Columbia, was the culmination of a ten month inter-agency policy review and formulation process.³⁵ An important part of the directive coming from the policy reads: "The United States encourages domestic commercial exploitation of space capabilities, technology, and systems for national economic benefit. These activities must be consistent with national security concerns, treaties, and international agreements."³⁶

The Space Policy directive created the Senior Inter-agency Group on Space (SIG-Space), which is chaired by the Assistant to the President for National Security Affairs.³⁷ SIG-Space was created to implement the policies announced by the President on July 4, 1982.³⁸ Among the issues addressed by SIG-Space was the commercial space launch business. SIG-Space's work on that issue resulted in the Presidential Directive on the Commercialization of Expendable Launch Vehicles of May 26, 1983.³⁹ The directive states that one of the government's basic goals should be to "encourage the private sector development of commercial launch operations."⁴⁰ To help realize this goal, regulation would be kept to a minimum and government facilities would be made available on a reimbursable basis.⁴¹

³⁵ *Id.* at 872. The agencies and departments which participated in the policy review were State, Defense, Commerce, the Director of Central Intelligence, the Joint Chiefs of Staff, the Arms Control and Disarmament Agency, NASA, the National Security Council, and the Office of Management and Budget. *Id.* at 875-76.

³⁶ *Id.* at 873.

³⁷ *Id.* at 875.

³⁸ *Id.* The other members of SIG-Space are the Deputy Secretary of Defense, the Deputy Secretary of State, the Deputy Secretary of Commerce, the Director of Central Intelligence, the Chairman of Joint Chiefs of Staff, the Director of the Arms Control and Disarmament Agency, and the Administrator of NASA. *Id.*

³⁹ FINCH & MOORE, *supra* note 21, at 56-57.

⁴⁰ *Id.* at 57.

⁴¹ *Id.* The directive specifically stated:

(1) The government will license, supervise, and regulate commercial ELV operations only to the extent required to meet national and international obligations and to ensure public safety.

(2) The government will make available on a reimbursable basis facilities, equipment, tooling, and services required to support the production and operation of commercial ELVs.

(3) While the government will not subsidize the commercialization

To implement the objective of the 1983 directive, President Reagan issued Executive Order 12,465 on February 24, 1984.⁴² This order designated the Department of Transportation (DOT) as the lead federal agency for encouraging and facilitating private commercial ELV activities.⁴³ To handle this new responsibility, the Secretary of Transportation, Elizabeth Dole, established the OCST within the DOT.⁴⁴ Although the OCST had operated informally since November 16, 1983,⁴⁵ Secretary Dole officially delegated the duties enumerated in Executive Order 12,465 to the director of the OCST on February 24, 1984.⁴⁶ The Secretary's order described OCST's primary responsibility to be the "[f]ocal point within the Federal government for private sector space launch contacts and licensing related to commercial expendable launch vehicle operations and for promotion and encouragement of commercial expendable launch vehicle industry."⁴⁷

As the Administration was making progress, Congress realized the need for an organized policy toward the regulation of private launch activities and took steps to codify the policy and administrative developments discussed above. Congress enacted, and sent to President Reagan, the Commercial Space Launch Act, partially in the hope that a change in administrations would not result in a modification of the steps already taken toward ELV regu-

of ELVs, it will price the use of its facilities, equipment, and services consistent with the goal of encouraging viable commercial ELV launch activity.

(4) The government will review and approve any proposed commercial launch facility and range as well as subsequent operations conducted therefrom. Near-term demonstration or test flights of commercial launch vehicles conducted from other than a U.S. government national range will be reviewed on a case-by-case basis using existing licensing authority and procedures.

Id.

⁴² Exec. Order No. 12,465, 49 Fed. Reg. 7211 (1984).

⁴³ *Id.* at § 1.

⁴⁴ 50 Fed. Reg. 7782 (1985) (to be codified at 49 C.F.R. § 1.22(a)).

⁴⁵ Myers, *supra* note 27, at 42-43.

⁴⁶ 50 Fed. Reg. 7782 (1985) (to be codified at 49 C.F.R. § 1.68).

⁴⁷ *Id.*

lation.⁴⁸ After enactment on October 10, 1984, Secretary Dole delegated the responsibilities given DOT by the Commercial Space Launch Act to the OCST.⁴⁹

II. THE COMMERCIAL SPACE LAUNCH ACT

Space Services' experience with the jungle of regulations and agencies which might govern private launch activities demonstrated the need to design a better system.⁵⁰ The Commercial Space Launch Act of 1984 is Congress' response to that need.⁵¹ The following discussion is an outline and analysis of the Act's provisions and the regulations promulgated to implement the Act.

A. *Persons and Activities Covered*

Section 2605 of the Act prohibits the launch of a "launch vehicle" or operation of a launch site by any person within the United States or any United States citizens outside of the United States unless authorized by a license issued under the Act.⁵² A "launch vehicle" is defined in section 2603(6) as "any vehicle constructed for the purpose of operating in, or placing a payload in, outer space and any suborbital rocket."⁵³ This definition appears to bring expendable launch vehicles and reuseable launch vehicles within the Act's coverage. By design, however, the definition does not include upper stages.⁵⁴ Congress intentionally left the licensing of upper stages to later

⁴⁸ S. REP. NO. 656, 98th Cong., 2d Sess. 2, reprinted in 1984 U.S. CODE CONG. & ADMIN. NEWS 5328, 5329 [hereinafter Senate Report 656].

⁴⁹ 50 Fed. Reg. 9036 (1985) (to be codified at 49 C.F.R. § 1.68).

⁵⁰ Senator Paul S. Trible, in his opening statement to hearings on the Commercial Space Launch Act, estimated that the regulatory jungle may include as many as eighteen federal agencies and twenty-two statutes. *To Facilitate Certain Space Launches, and for Other Purposes, 1984: Hearings on S. 2931 Before the Subcomm. on Science, Technology, and Space of the Senate Comm. on Commerce, Science, and Transportation*, 98th Cong., 1st Sess. (1984).

⁵¹ The Commercial Space Launch Act, 49 U.S.C. § 2601 (Supp. II 1984).

⁵² 49 U.S.C. § 2605(a) (Supp. II 1984).

⁵³ *Id.* at § 2603(b).

⁵⁴ An upper stage is essentially a rocket engine intended to elevate a payload from a low earth orbit to a higher earth orbit.

consideration, reasoning that the role and capabilities of upper stages are presently too uncertain to address.

The Act does not give the DOT licensing authority over the payloads aboard a launch vehicle. A launch license holder, however, must comply with all regulations and laws applicable to the payload before deployment.⁵⁵ If a license or permit is required for the payload, the DOT need only ascertain that the operator obtained a license.⁵⁶ When a payload licensing scheme does not cover a proposed payload, the DOT has the responsibility to assess the potential for harm to the public, property, national security, or foreign policy interests of the United States and, if necessary, to prevent the launch.⁵⁷

The term "payload" is defined as "an object which a person undertakes to place in outer space by means of a launch vehicle, and includes subcomponents of the launch vehicle specifically designed or adapted for that object."⁵⁸ Under this definition, the OCST has found only two types of payloads exclusively licensed by other federal agencies: telecommunications satellites by the Federal Communications Commission and remote sensing satellites by the Department of Commerce.⁵⁹ However, "payload" might include passengers or passenger modules. Because a passenger module would necessarily return to earth, it might constitute a re-entry vehicle meeting the Federal Aviation Act's definition of an aircraft and thereby implicate the licensing authority of the Federal Aviation Administration. Therefore, in the future, when commercial space tourism begins, the FAA conceivably may need to issue an airworthiness certificate for payloads designed and "intended to be used for flight in the air."⁶⁰ The FAA more likely will not become involved in regulating combination space-air-

⁵⁵ See *id.* at § 2605(b)(1) (Supp. II 1984).

⁵⁶ See *id.*

⁵⁷ *Id.* at § 2605(b)(2).

⁵⁸ *Id.* at § 2603(f).

⁵⁹ 51 Fed. Reg. 6870, 6875 (1986) (to be codified at 14 C.F.R. ch. 111).

⁶⁰ The FAA issues airworthiness certificates pursuant to 49 U.S.C. app. § 1424 (1982) and 14 C.F.R. pt. 3 (1986). An "aircraft" is defined by the FAA as "a

craft vehicles as it did with the space shuttle.⁶¹ This would leave regulation of passenger carrying space-aircraft to the OCST.⁶²

Section 2606 of the Act brings launch sites under the DOT's control.⁶³ The OCST is now responsible for the licensing of all aspects of a private launch site except radio communications. The FCC retains authority over use of the radio spectrum.⁶⁴ Although the OCST has developed some regulations to cover the licensing of launch sites, it believes that more investigation and regulations will be needed.⁶⁵

Because the United States bears international responsibility for the activities of its nationals in outer space under Article Six of the Outer Space Treaty⁶⁶ and for damages caused by space objects launched from within its territory under the Liability Convention,⁶⁷ a launch license is required for all launches by United States citizens and for all launches from within the United States.⁶⁸ Launch activities of the United States government are exempt from the Act.⁶⁹ A "United States citizen" includes all citizens, busi-

device that is used or intended to be used for flight in the air." 14 C.F.R. § 1.1 (1986).

⁶¹ In a March 11, 1977 letter the Chief Counsel of the FAA concluded the shuttle is not an aircraft "for purposes of the FAAct respecting applicability of the Federal Aviation Regulations (FARs)." Mossinghoff & Sloup, *Legal Issues Inherent in Space Shuttle Operation*, 6 J. SPACE L. 47, 65-66 (1978).

⁶² For a discussion of the review process for payloads to be launched, see *infra* notes 100-105 and accompanying text.

⁶³ See 49 U.S.C. § 2606 (Supp. II 1984).

⁶⁴ See *id.* at § 2605(c)(2).

⁶⁵ 51 Fed. Reg. 6870, 6873 (1986)(to be codified at 14 C.F.R. ch. 111).

⁶⁶ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, United States-United Kingdom-USSR, art. VI, 18 U.S.T. 2410, T.I.A.S. No. 6347 (providing that signatory states bear international responsibility for national activities in outer space whether conducted by governmental or non-governmental entities).

⁶⁷ Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, United States-United Kingdom-USSR, 24 U.S.T. 2389, T.I.A.S. No. 7762 (imposing liability on signatory states for damages caused by space objects launched by non-governmental entities).

⁶⁸ 49 U.S.C. § 2605(a) (Supp. II 1984).

⁶⁹ See SENATE REPORT 656, *supra* note 48, at 3, reprinted in 1984 U.S. CODE CONG. & ADMIN. NEWS 5328, 5330.

ness entities organized in the United States, and foreign corporations controlled by United States citizens or business entities.⁷⁰ The license requirement for citizens applies equally to launches from within and from without the United States.⁷¹ While the only near-term private launches will likely be commercial in nature, the Commercial Space Launch Act applies equally to "not for profit" launches such as a university research launch.⁷²

B. *The Office of Commercial Space Transportation*

The Office of Commercial Space Transportation, operating informally since 1983, was officially delegated the responsibility of administering the Commercial Space Launch Act on October 30, 1984.⁷³ Its director is authorized to exercise all the authorities given to the Secretary of Transportation by the Commercial Space Launch Act.⁷⁴ The OCST's primary duty is the licensing of activity related to commercial space transportation. The Act, however, gives the OCST additional responsibilities and authority. These duties include monitoring and enforcement of the Act's provisions as well as oversight of the use of government equipment and facilities.

Section 2616 of the Act gives the OCST the authority to investigate activities covered by the Act's provisions.⁷⁵

⁷⁰ See 49 U.S.C. app. § 2603(11) (Supp. II 1984).

⁷¹ See *id.* at § 2605(a). Section 2605(a) generally requires a license for all launches within the United States and for all launches by United States citizens outside the United States. *Id.*

⁷² See SENATE REPORT 656, *supra* note 48, at 8, reprinted in 1984 U.S. CODE CONG. & ADMIN. NEWS 5328, 5335.

⁷³ 50 Fed. Reg. 9036 (1985) (to be codified at 49 C.F.R. pt. 1).

⁷⁴ 51 Fed. Reg. 6870, 6872 (1986) (to be codified at 14 C.F.R. § 401.3).

⁷⁵ 49 U.S.C. § 2616(b) (Supp. II 1984). This section allows any employee of the DOT to

enter at any reasonable time any launch site, production facility, or assembly site of a launch vehicle, or any site where a payload is integrated with a launch vehicle, for the purpose of inspecting any object which is subject to this chapter and any records or reports required by the Secretary to be made or kept under this chapter. . . .

Id. at § 2616(b)(2)(A).

Section 2617 makes violation of the Act unlawful,⁷⁶ and section 2618 imposes civil penalties for such violations.⁷⁷ Section 2613 of the Act and section 405.1 of the regulations allow the OCSST to monitor licensed activity.⁷⁸ Such monitoring does not violate the fourth amendment search warrant requirement because, as discussed in *Almeida-Sanchez v. United States*,⁷⁹ a businessman who engages in a pervasively regulated activity impliedly consents to warrantless searches.⁸⁰

Section 2614 directs the OCSST to sell extra and unnecessary government launch equipment.⁸¹ The agency possessing the equipment sets the price for the equipment, but in no circumstances may the agency set the price below the fair market value.⁸² In the case of launch services, the cost must be the direct cost incurred by the government.⁸³ These provisions are important in the development of a private launch industry because the expense of constructing a launch facility will force private launch companies to use existing government facilities. In the wake of the Reagan Administration's new shuttle policy, however, one of the uncertainties facing the private launch industry is the lack of a policy on use of government-owned launch facilities.⁸⁴ Section 2614 appears to place the responsibility of such policy formation with the

⁷⁶ *Id.* at § 2617.

⁷⁷ *Id.* at § 2618(a). This section provides up to a \$100,000 fine for each violation. Each day of a continuing violation constitutes a separate violation. The Secretary assesses the penalty by written notice. *Id.*

⁷⁸ *Id.* at § 2613; 51 Fed. Reg. 6,870 (1986) (to be codified at 14 C.F.R. § 405.1).

⁷⁹ 413 U.S. 266 (1973).

⁸⁰ *Id.* at 271. *Almeida-Sanchez* involved the warrantless search of a motor vehicle near the United States-Mexico border. *Id.* at 276. The Court distinguished the case from searches in federally licensed and regulated industries, stating "when a dealer chooses to engage in this pervasively regulated business and to accept a federal license, he does so with the knowledge that this business . . . will be subject to effective inspection." *Id.* at 271 (quoting *United States v. Biswell*, 406 U.S. 311, 316 (1972)).

⁸¹ 49 U.S.C. § 2614(a) (Supp. II 1984).

⁸² *Id.* at § 2614(b)(1).

⁸³ *Id.*

⁸⁴ Foley, *supra* note 9, at 22.

OCST. Without a launch facility pricing policy, the private launch industry will face another development delay.

C. License Application Process

Before a vehicle may be launched, the OCST must issue a license.⁸⁵ Before the OCST will issue a license for an unmanned launch, the applicant must obtain mission and safety approval.⁸⁶ This bifurcated licensing process allows the government to effectively review its two major areas of concern and allows an applicant to receive approval of certain matters during the planning stages of a launch.⁸⁷ A license will contain the conditions an applicant must meet before launching. Failure to comply with those conditions will result in disapproval of the license application.⁸⁸ The OCST has diagrammed the licensing procedure as follows:⁸⁹ [see diagram on following page]

1. Safety Review

The safety review process leads to "safety approval," one of the two "approvals" necessary for obtaining a license. The process is designed to ensure that a proposed launch and any accompanying payloads do not endanger public safety.⁹⁰ If the vehicle is to be launched from a federally operated range or a site operated under a license issued by the OCST, the safety review process is rather short. In most instances safety approval will be given when the proposed launch has been accepted by a range or launch site capable of handling the launch.⁹¹ The OCST will then condition the license upon compliance with the range or site operation regulations.⁹² This presumption of safety afforded federal ranges and licensed

⁸⁵ 49 U.S.C. § 2605(a)(1) (Supp. II 1984).

⁸⁶ 51 Fed. Reg. 6870, 6875 (1986) (to be codified at 14 C.F.R. § 415.5).

⁸⁷ *Id.* at 6873 (to be codified at 14 C.F.R. § 411.3).

⁸⁸ *Id.* at 6875 (to be codified at 14 C.F.R. § 415.9).

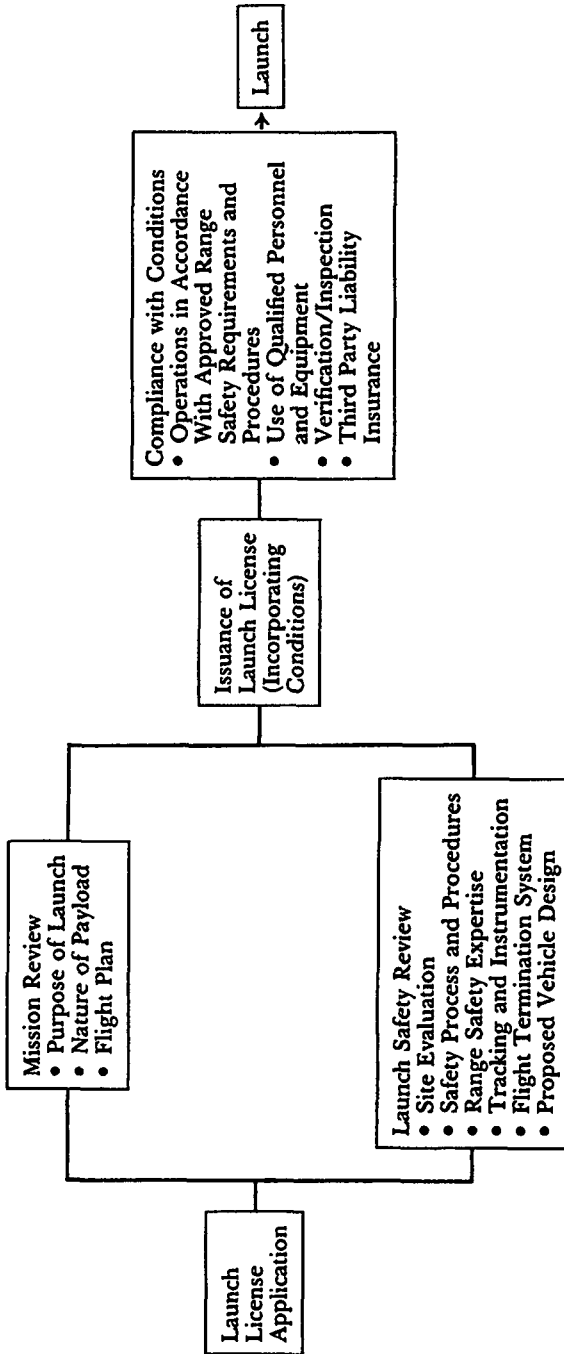
⁸⁹ 50 Fed. Reg. 7714, 7716 (1985).

⁹⁰ 51 Fed. Reg. 6870, 6881 (1986) (to be codified at 14 C.F.R. § 415.11).

⁹¹ *Id.* at 6879 (to be codified at 14 C.F.R. § 411.5).

⁹² *Id.*

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Note: Review Elements and Procedures are for Illustrative Purposes Only.

private sites operates under the assumption that the ranges and sites conform to general standards for location, operation procedures, personnel qualifications, and equipment quality.⁹³

If, however, the launch is to take place from a site not already licensed, the safety process is long and complicated.⁹⁴ Because launch site safety standards or requirements have not yet been developed, the OCST will treat each launch site license application on a case-by-case basis.⁹⁵ Existing regulations governing a proposed launch from an unlicensed launch site require the applicant to submit detailed information designed to check for a safe site location, proper operating procedures, qualified personnel, and adequate equipment.⁹⁶ The safety review process will also examine the payloads accompanying the launch vehicle.⁹⁷ If the payload is a communication satellite or a remote sensing satellite, the OCST, will for safety review purposes, initially determine whether a license has been issued by the Federal Communications Commission or the Commerce Department,⁹⁸ respectively. If no federal agency has licensed the payload, the OCST must then ensure that the payload will not jeopardize public safety.⁹⁹

⁹³ *Id.* at 6880-82, (to be codified at 14 C.F.R. § 415.13).

⁹⁴ *Id.* at 6875. The applicant proposing to launch must demonstrate that it possesses the capability and resources for safely conducting the preparation and launch of a launch vehicle and any accompanying payloads. *Id.* at 6879 (to be codified at 14 C.F.R. § 411.5).

⁹⁵ *Id.* at 6874. The OCST is developing regulations to cover commercial launch site operations. *Id.* at 6879 (to be codified at 14 C.F.R. § 411.3).

⁹⁶ *Id.* at 6870, 6881-82 (1986) (to be codified at 14 C.F.R. § 415.17).

⁹⁷ For a definition of the term "payload," see text accompanying note 58 *supra*.

⁹⁸ See 49 U.S.C. § 2605(b)(1) (Supp. II 1984); see also *supra* note 59 and accompanying text.

⁹⁹ 49 U.S.C. § 2605(b)(2) (Supp. II 1984). While the Commercial Launch Act grants the DOT authority to prevent a launch if the payload will endanger public safety, the information which must be reported as part of the safety review for launches from licensed sites does not include payload information. See 51 Fed. Reg. 6870, 6882-83 (1986) (to be codified at 14 C.F.R. §§ 415.17, 415.25). The mission review reporting requirements probably cover this technical flaw.

2. *Mission Review*

The mission review process focuses primarily on the payload to be launched.¹⁰⁰ If another agency is responsible for licensing a payload, the OCST need only ascertain that such an agency has issued a license, and the mission review process for the payload ends.¹⁰¹ When no licensing process otherwise exists, the OCST, in consultation with the Department of Defense and the Department of State, will examine any "national security interests" and "foreign policy interests or obligations of the United States" a proposed payload launch may present.¹⁰²

Consultation with the Department of State, it is hoped, will ensure United States compliance with international agreements and spot potential foreign policy complications.¹⁰³ For instance, the obligations created by international agreements include the liability provisions placed upon the United States for damage caused by private space activity.¹⁰⁴ A foreign policy consideration may en-

¹⁰⁰ 51 Fed. Reg. 6870, 6882-83 (1986) (to be codified at 14 C.F.R. §§ 415.21, 411.7).

¹⁰¹ 49 U.S.C. §§ 2605(b)(1), 2605(c)(2) (Supp. II 1984).

¹⁰² Section 2619 of the Commercial Space Launch Act requires the DOT to consult with the Department of Defense and the Department of State. Specifically, section 2619 provides as follows:

(a) Matters of national defense

The Secretary shall consult with the Secretary of Defense on all matters, including the issuance or transfer of each license, under this chapter affecting national security. The Secretary of Defense shall be responsible for identifying and notifying the Secretary of those national security interests of the United States which are relevant to activities under this chapter.

(b) Matters of foreign policy

The Secretary shall consult with the Secretary of State on all matters, including the issuance or transfer of each license, under this chapter affecting foreign policy. The Secretary of State shall be responsible for identifying and notifying the Secretary of those foreign policy interests or obligations of the United States which are relevant to activities under this chapter.

51 Fed. Reg. 6870, 6879 (1986) (to be codified at 14 C.F.R. § 411.7(b)) makes these consultations part of the mission review process.

¹⁰³ Notice of Policy and Request for Comments, 50 Fed. Reg. 7714, 7717 (1985) (to be codified at 14 C.F.R. ch. 111).

¹⁰⁴ See, e.g., Convention on International Liability for Damage Caused by Space

compass possible interference with another nation's use of space.

The OCST's consultation with the Department of Defense involves different concerns. Namely, the objective is to recognize issues in the area of national security. A national security concern, for example, would include preventing a collision between the proposed payload and a classified Department of Defense satellite.

An applicant may go through the safety review process before or after the mission review process.¹⁰⁵ Also, the OCST encourages informal inquiries by applicants to avoid later difficulties.¹⁰⁶ Once a formal application is filed, the OCST must make a determination within 180 days.¹⁰⁷ During the application process the OCST, not the applicant, has the duty of shepherding the application through the licensing process.¹⁰⁸ After the licensing process has been navigated once, the OCST hopes to avoid *de novo* application reviews for repeat or similar license applications.¹⁰⁹

While the licensing process designed by the OCST is a good start, several aspects of the scheme will have to be altered as the need for launch licenses increases. First, when private ELV launches become frequent, particularly when reusable launch vehicles are in operation, the mission review process could become burdensome.¹¹⁰ Second, while the safety review process likely will develop

Objects, Mar. 29, 1972, United States-United Kingdom-USSR, art. II, 24 U.S.T. 2389, T.I.A.S. No. 7762.

¹⁰⁵ 51 Fed. Reg. 6870, 6879 (1986) (to be codified at 14 C.F.R. § 411.3(a)).

¹⁰⁶ *Id.* at 6880 (to be codified at 14 C.F.R. § 413.3).

¹⁰⁷ 49 U.S.C. § 2608(b) (Supp. II 1984). If the OCST has not made a determination within 120 days after receipt of the application, the OCST must inform the applicant of any pending issues and of actions required to resolve those issues. *Id.*

¹⁰⁸ 51 Fed. Reg. 6870, 6874, 6880 (1986) (to be codified at 14 C.F.R. § 413.9).

¹⁰⁹ *Id.* at 6880 (to be codified at 14 C.F.R. § 413.9).

¹¹⁰ The Center for Space Policy, in its market forecast for space transportation, anticipates the private operation of two space shuttles. A Market Forecast, *supra* note 8, at 143. The likelihood of privately operated space shuttles has been increased by the Reagan Administration's decision to build a fourth shuttle. With the assembly line activated for a fourth shuttle, the cost of a privately financed shuttle will be reduced.

published technical standards accessible to all, the yardstick used in the mission review process, namely the "national security interests" or "foreign policy interests and obligations" of the United States,¹¹¹ is too open-ended for advanced mission planning in some instances. The constantly changing definitions of "national security interests" and "foreign policy interests and obligations" may make the advanced planning necessary for space activity very difficult. For example, a joint venture in materials processing between a United States firm and a foreign firm may be acceptable one year, but may run afoul of national security or foreign policy interests the next year because the foreign firm may come from a now unfriendly country. An applicant could obtain mission approval early in a project,¹¹² but find that mission approval withdrawn when the time comes for issuance of the final license.¹¹³ Such reliance could result in substantial losses.¹¹⁴ The uncertainty created by the vague terms "national security interests" and "foreign policy interests and obligations" could chill investment in private space activity. Unambiguous criteria and guarantees of continued acceptance and validity need to be put into the mission review process.

D. *Application and License Requirements*

Because the licensing process is untested and the private launch industry is undeveloped, the requirements an applicant must satisfy are presently only general in nature. Knowing this, the OCST is encouraging potential appli-

¹¹¹ See *supra* note 102 and accompanying text.

¹¹² 51 Fed. Reg. 6870, 6879 (1986) (to be codified at 14 C.F.R. § 411.3(a)).

¹¹³ While the introductory note to the regulations published in the Federal Register states that an advanced mission approval will be made part of the record and remain valid, the note later states that the OCST will review a previous approval when significant or substantial changes occur. *Id.* at 6875.

¹¹⁴ Though the equities of such a scenario would weigh in favor of the license applicant, a license or aspect of a license does not create a vested right capable of being "taken" for constitutional purposes. *O'Connor v. Superior Court*, 90 Cal. App. 3d 107, 153 Cal. Rptr. 306 (1979). See also 51 AM. JUR. 2D *Licenses and Permits* § 18 (1970).

cants to informally consult with OCAST before applying for a license to determine specific license requirements.¹¹⁵ The existing license requirements can be separated according to the bifurcated licensing process discussed in the preceding section.

1. *Safety Review*

While the OCAST is responsible for licensing both individual launches and private launch sites, the OCAST has not yet developed safety standards for private launch sites¹¹⁶ and manned launches.¹¹⁷ The existing regulations which do touch upon site safety do so indirectly. If an applicant for a one-time (single) launch license intends to use an unlicensed launch site, the applicant must provide a great deal more information than if a government facility or licensed launch site were used.¹¹⁸ Until specific site standards are developed, the OCAST will handle the current site license inquiries on a case-by-case basis.¹¹⁹

When an individual launch license application is filed, the OCAST determines whether the applicant can safely launch a proposed payload.¹²⁰ The OCAST examines four areas of concern: site location safety, operating procedures adequacy, personnel qualifications, and equipment adequacy.¹²¹ In most cases, when the launch is to occur at a federal range, the four safety areas of concern are satisfied by a statement verifying that the range operator has accepted the launch and listing the parties responsible for conducting all parts of the launch operations.¹²² At this

¹¹⁵ 51 Fed. Reg. 6870, 6874 (1986) (to be codified at 14 C.F.R. ch. 111).

¹¹⁶ *Id.* at 6873-74.

¹¹⁷ The OCAST intends to specifically address manned flight in the future. *Id.* at 6873.

¹¹⁸ *Id.* at 6875 (to be codified at 14 C.F.R. § 415.17).

¹¹⁹ *Id.* at 6873-74. Part of the case-by-case review of a site license application will include matters of radio frequency access. The Commercial Space Launch Act preserves the FCC's authority in this area. 49 U.S.C. §§ 2605(c)(2), 2607(a)(1) (Supp. II 1984).

¹²⁰ 51 Fed. Reg. 6870, 6875 (1986) (to be codified at 14 C.F.R. § 415.13).

¹²¹ *Id.*

¹²² *Id.* (to be codified at 14 C.F.R. § 415.17).

point in the development of its regulations, the OCST is relying heavily upon the technical expertise of the federal range operators.

The Commercial Space Launch Act does not supersede or repeal any existing federal statutes or regulations directly applicable to private launches.¹²³ So far, though, only federal aviation regulations governing unmanned rocket activity,¹²⁴ the FCC's authority to license communication satellites,¹²⁵ and the Department of Commerce's authority to license remote sensing satellites¹²⁶ have been found directly applicable.¹²⁷ Therefore, during the safety review process, except for those three areas, the OCST is entirely responsible for protecting the public's safety.¹²⁸ Except for the licensing authority of the the FCC and Department of Commerce, however, the OCST may waive an existing federal statute or regulation if that waiver would be in the public interest and would not jeopardize public safety, public property, or foreign policy interests.¹²⁹

¹²³ See SENATE REPORT 656, *supra* note 48, at 3, reprinted in 1984 U.S. CODE CONG. & ADMIN. NEWS, at 5330. The Commercial Space Launch Act specifically exempts launch vehicles and payloads from export control acts. 49 U.S.C. § 2620(b) (Supp. II 1984). Although export laws are of questionable application, the Department of State used the Arms Export Control Act to obtain authority over Space Services' launch of the Conestoga I in 1982. Dula, *supra* note 22, at 180.

¹²⁴ 14 C.F.R. §§ 101.21-.25 (1986). The FAA and OCST have agreed that the OCST will administer the requirements of 14 C.F.R. §§ 101.21-.25. See 51 Fed. Reg. 6870, 6873 (1986) (to be codified at 14 C.F.R. ch. 111).

¹²⁵ Communications Act of 1934, 47 U.S.C. §§ 151-610 (1982 & Supp. III 1985).

¹²⁶ Land Remote-Sensing Commercialization Act of 1984, 15 U.S.C. §§ 4201-4292 (Supp. III 1985).

¹²⁷ The licensing authority of the FCC and Commerce Department is specifically exempted from the DOT's authority under the Commercial Space Launch Act. 49 U.S.C. § 2605(c)(2) (Supp. II 1984).

¹²⁸ Part of the OCST's responsibility includes assessing the environmental impact of a launch according to the requirements of the National Environmental Policy Act. 51 Fed. Reg. 6870, 6876 (1986) (to be codified at 14 C.F.R. § 514.41).

¹²⁹ 49 U.S.C. § 2607(a)(2) (Supp. II 1986); 51 Fed. Reg. 6870, 6872-73 (1986) (to be codified at 14 C.F.R. § 404.3).

2. Mission Safety

The mission review process is intended to protect the "public health and safety, the safety of property, and the national security and foreign policy interests of the United States. . . ." ¹³⁰ To perform this function the OCST requires that an applicant supply information for each of three areas—launch plan, payload operation, and financial responsibility. Launch plan information includes a description of the launch vehicle, a flight plan, and a list of unique hazards that might be posed by the launch or re-entry. ¹³¹ Payload operation information includes the nature and ownership of the payload. ¹³² If the payload is not licensed by the FCC or the Department of Commerce, the information requirements expand to include an assessment of safety issues, the payload's design, and the payload's proposed orbit. ¹³³ The required financial responsibility information includes either evidence of commercial third-party liability coverage or evidence of the purchase of a commercial surety bond. ¹³⁴ The OCST determines the amount of insurance coverage or the amount of the bond. ¹³⁵

As mentioned earlier, the Commercial Space Launch Act requires that the Departments of Defense and State assist the OCST in evaluating the information submitted for the mission review process. ¹³⁶ While disagreements among the three agencies are not likely, the vagueness of the criteria, "national security interests" and "foreign policy interests and obligations," ¹³⁷ will lead to some different conclusions. The possibility of different conclusions

¹³⁰ 51 Fed. Reg. 6870, 6883 (1986) (to be codified at 14 C.F.R. § 415.27). See also *id.* at 6879 (to be codified at 14 C.F.R. § 411.7(a)).

¹³¹ *Id.* at 6875 (to be codified at 14 C.F.R. § 415.25).

¹³² *Id.* (to be codified at 14 C.F.R. § 415.25(e)).

¹³³ 51 Fed. Reg. 6883 (1986) (to be codified at 14 C.F.R. § 415.27).

¹³⁴ 50 Fed. Reg. 19,280, 19,281 (1985) (to be codified at 14 C.F.R. ch. 111).

¹³⁵ 49 U.S.C. § 2614(c) (Supp. II 1984).

¹³⁶ See *supra* notes 102-104 and accompanying text.

¹³⁷ See 49 U.S.C. § 2619(a),(b) (Supp. II 1984); *supra* note 102 and accompanying text.

has raised questions such as: Whose conclusion must prevail? Who is responsible for arbitrating a disputed mission review conclusion? So far, the OCST's response to these questions has been unclear and evasive. For example, the OCST recently stated, "[i]n the unlikely event of a genuinely irreconcilable disagreement between the Department [of Transportation] and either of these agencies, the issue would be resolved in the same manner as any such matter is handled . . . : Through appropriate discussions within the Executive Branch."¹³⁸ A reasonable interpretation of this response is that the White House will have the final say on disputed matters of national security and foreign policy. Nevertheless, the potential delay and uncertainty created by this unstructured consultation scheme is bound to impede the development of a private launch industry and an efficient regulatory regime.

E. *The Sale of Launch Equipment and Services*

Section 2614 of the Commercial Space Launch Act requires the OCST to "facilitate and encourage" the private sector in acquiring excess government launch property and services.¹³⁹ While the Senate report on the Act explains that the OCST's role is only to ensure pricing that will encourage the commercial launch industry, the Act is not intended to alter any agency's existing authority.¹⁴⁰ Therefore, the OCST's role in selling government launch property and services is unclear. Much of this uncertainty comes from the tone of the Act. For example, section

¹³⁸ 51 Fed. Reg. 6870, 6872 (1986) (to be codified at 14 C.F.R. ch. 111).

¹³⁹ 49 U.S.C. § 2614(a) (Supp. II 1984). Section 2614(a) provides as follows:

The Secretary shall take such actions as may be necessary to facilitate and encourage the acquisition (by lease, sale, transaction in Lieu of Sale, or otherwise) by the private sector of launch property of the United States which is excess or is otherwise not needed for public use and of launch services, including utilities, of the United States which are otherwise not needed for public use.

Id.

¹⁴⁰ SENATE REPORT 656, *supra* note 48, at 15, reprinted in 1984 U.S. CODE CONG. & ADMIN. NEWS, at 5342.

2614 appears to appoint the OCST as a marketing agent for government launch property and services.¹⁴¹ Some of the uncertainty, however, comes from the Reagan Administration's indecisive limits on NASA's commercial activity.¹⁴² Only the Administration can straighten out this confusion.

Section 2614 also establishes pricing guidelines.¹⁴³ All sales should guarantee a reasonable return to the federal government and provide no direct subsidies.¹⁴⁴ In light of the cost barriers and international competition faced by private launch service providers, this policy might have to be re-evaluated. In some manner or another the United States shuttle, French Ariane, and Soviet Union commercial launches have received government subsidies. To be competitive, the United States private launch industry may need access to low cost government launch services.

III. EVALUATION

The Commercial Space Launch Act is a good start for the development of a viable private launch industry in the United States. It creates the framework for developing a workable regulating bureaucracy. Without immediate action to keep the momentum going, however, the objective of developing a viable private launch industry will be in danger.

In the short run, five specific steps should be taken. First, the OCST should have its own personnel capable of dealing with the technology of space transportation, rather than relying on consultation with NASA or other agencies.¹⁴⁵ When the OCST must rely upon NASA or the Air Force for technical advice during the safety review

¹⁴¹ See *supra* note 139 and accompanying text.

¹⁴² See *supra* note 9 and accompanying text.

¹⁴³ See 49 U.S.C. § 2614(b)(1) (Supp. II 1984).

¹⁴⁴ See *id.*; SENATE REPORT 656, *supra* note 48, at 15, reprinted in 1984 U.S. CODE CONG. & ADMIN. NEWS, at 5342.

¹⁴⁵ For a further discussion of the problems caused by lack of technically trained personnel in the OCST, see *Management of Commercial Space Transportation Office May Be Reorganized*, AV. WEEK & SPACE TECH., Sept. 29, 1986, at 16.

process, three potential problems could develop. First, paper shuffling between agencies and NASA personnel's inability to respond immediately to requests from the OCST would delay the licensing process. Second, because the line of communication between technical personnel and the decision makers would be long and structured, the quality of communication and, thus, the quality of the decision would be adversely affected. Third, NASA, the Air Force, and any other agency involved have their own turfs to protect, which perhaps would color their advice.

The second step which should be taken in the short run is the promulgation of some minimum technical safety standards. With known minimum standards in place, common industry practices could be developed. Common industry practices would take some of the uncertainty out of the regulatory process and reduce the time and effort required for obtaining a license.

The third step, similar to the second step, should be the promulgation of specific criteria or standards to be used when identifying "national security interests" or "foreign policy interests or obligations of the United States"¹⁴⁶ during the mission review process. The publication of at least minimum standards would help to stabilize the private launch industry and streamline the license application process. These minimum standards would be helpful even if they were subject to change during the mission review process.

Fourth, when mission approval is given before the final license is issued, the OCST should be forbidden from withdrawing mission approval for political reasons unrelated to safety. Alternatively, if mission approval is withdrawn for political reasons unrelated to safety, the license applicant should be compensated for lost investment or revenue. As discussed earlier in the license application process section, the financial uncertainty created by the

¹⁴⁶ See *supra* note 102 and accompanying text.

ambiguous and ever-changing notion of "national security interests" or "foreign policy interests and obligations of the United States" will restrain the development of a private space transportation industry.¹⁴⁷ Reimbursement not only would eliminate financial uncertainty, but also would prevent the OCST from withdrawing mission approval for trivial matters.

The fifth short run step which should be taken is the creation of an environment conducive to the development of a private space transportation industry. Such a step would involve political decisions as well as modification of the existing legal regime. For example, the Administration and NASA should announce a firm policy on NASA's future commercial activity. Further, to cover assembly line start-up costs, a guaranteed market for expendable launch vehicles, probably through military contracts, should be created. Finally, to create some certainty, a policy governing access to government launch facilities and charges for facility use should be enacted.

In the long run, streamlining the entire regulatory system will be necessary. As the launch of ELVs becomes a regular occurrence, and particularly when a space shuttle system or hypersonic space plane is privately operated, a very quick, if not automatic, licensing process will be needed. A one-time licensing of the operator with continued oversight by the government, similar to the system used to regulate private airlines, might be best.

While this one-time licensing scheme may appear to ignore some of the governmental obligations to monitor private space activity created by the Outer Space Treaty¹⁴⁸ and the Liability Convention,¹⁴⁹ sufficient procedures to meet those obligations can be created. Just as the United States establishes airworthiness standards for United States registered aircraft engaged in international

¹⁴⁷ See *supra* notes 111-114, 136-138 and accompanying text.

¹⁴⁸ See *supra* note 66 and accompanying text.

¹⁴⁹ See *supra* note 66 and accompanying text.

flight,¹⁵⁰ the United States could establish spaceworthiness standards for space transportation systems. Such spaceworthiness standards would cover the safety review process concerns.

Further, to monitor private space activity, a route approval or flight plan filing system similar to that used in the airline industry could be established for space transportation. Such a system would be activated when a space transporter filed a flight plan with a launch site operator. The launch site operator would first check the flight plan for compliance with federally established flight regulations (including nonpermitted space activity). The launch site operator would then clear the flight plan with a national, and even possibly an international, space flight control center.

As the call for a national and an international space flight control center suggests, the long run efficient regulation of private and governmental space transportation will require the creation of an international space agency. An organization similar to the International Civil Aviation Organization, but modified to meet the needs of space technology, must be created. Some of the matters an international space agency must address include the control of space traffic, the promulgation of rules of the road for space, protection of the space and earth environment,¹⁵¹ and the prevention of armed conflict in space. While the Commercial Space Launch Act provides a good beginning for regulating private space activity on a national level, an effective structure for regulating private and governmen-

¹⁵⁰ Convention on International Civil Aviation, Dec. 7, 1944, art. 31, 61 Stat. (2) 1180, 1189, T.I.A.S. No. 1591, 952, 15 U.N.T.S. 295, 316. Article 31 provides as follows: "Every aircraft engaged in international navigation shall be provided with a certificate of airworthiness issued or rendered valid by the State in which it is registered." *Id.*

¹⁵¹ An example of the threat posed to the space and the earth environment is the more than four dozen radioactive satellites now in an orbit of about 1000 kilometers. According to a study conducted by Nicholas L. Johnson, these four dozen satellites carry over a metric ton of highly enriched uranium-235 and plutonium-238. *Radioactive Space Debris Study Cites Hazards to Satellites, Earth*, AV. WEEK & SPACE TECH., Sept. 22, 1986, at 19.

tal space activity must reflect the international nature of the space medium. If space activity regulation does not move beyond the national level, the peaceful exploration of space for all of mankind will not be realized.

Comments

